Financial Stability of Islamic (Participation) Banks in Turkey

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Abstract

Since Global Financial Crisis the performance of Islamic banks and conventional banks have been an area of interest due to the difference in the principles of financial intermediation. Another area of interest is the financial stability characteristic of Islamic banks stemming from their business model. With the strong growth projection of Islamic banking in global finance, their soundness becomes of an increasing concern. The main goal of the paper is to investigate whether Islamic (participation) banks in Turkey are more stable than conventional banks using a Z-Score values in a panel data framework.

Keywords: Islamic Banks, Z-Score, Panel Data

JEL classification: G20, G21, C33.

1. Introduction

Global financial crisis had changed the view towards conventional banking model significantly. The build-up for the crisis have been mainly attributed to increasingly excessive leverage and use of highly complex financial instruments leading them to a stage where the term toxic is recognized. During this period, Islamic banks, which had weathered this turbulent time relatively sound and stable, gained attention both from bankers (i.e. banking industry investors in search for new business models) and policy makers as financial stability evolved as an explicit policy objective.

Moreover, Islamic finance has experienced considerable growth over the last decade. The oil exporter economies surplus contributed to the increased international capital flows. Compliance criteria to Islamic Law (Sharia) induced the use of Islamic financial instruments and Islamic banking business in all geographies. In this environment where Islamic finance is becoming a major field of business in banking, their stance as sound and stable institutions contribute to their growth.

In this study, the financial stability of Turkish Islamic banks is investigated in an attempt to fill the gap in empirical literature, while providing developments in global and Turkish Islamic banking market.

The following section is about Islamic banking at a global perspective. A brief history of Islamic banking in financial markets is given here. The third section is a section on principles of Islamic banking. The differences in the principles of conventional and Islamic banking seeds the difference in stability. Hence the following section gives a discussion on this issue. The fifth section provides a survey on empirical studies on Islamic banks, given the theoretical framework. The sixth section is on Turkish

Islamic banking market presenting a concise history and recent figures. The following section is the empirical analysis and the last section is for concluding remarks.

2. Islamic Banking at Global Perspective

While modern Islamic finance is growing within international finance, its history is quite recent. In its modern form, Islamic banking started with pioneering experiments in 1963 in Egypt. The Mit-Ghamr Islamic Saving Associations (MGISA) mobilized the savings of Muslim investors, providing them with returns that did not transgress the laws of the Shari'ah (Hussain, Shahmoradi and Turk, 2015:4). Again in Egypt, Nasr Social Bank was established as an Islamic Bank by a state support. This was followed by Philippine's Amanah Bank in 1973. After the launch of the 1st International Conference on Islamic Economics organized by King Abdul Aziz University in Saudi Arabia and the establishment of the first commercial Islamic bank, Dubai Islamic Bank (DIB) in the United Arab Emirates in 1975, the Islamic banking industry started to gain momentum (Iqbal and Molyneux, 2005). Another significant event should be noted as the establishment of The Islamic Development Bank as a multilateral development bank to "*foster the economic development and social progress of member countries and Muslim communities individually as well as jointly in accordance with the principles of Islamic Law*" (IDB; 2015). Thus following these initiatives many private and semi-private commercial Islamic banks were established especially in Egypt, Sudan, Kuwait, Bahrain, and Malaysia.

Table 1: Breakdown of Islamic Finance Segments by Region (USD billion, 2014)

Region	Banking Assets	Sukuk Outstanding	Islamic Funds Assets	Takāful Contributions
Asia	203.8	188.4	23.2	3.9
Gulf Cooperation Council (GCC)	564.2	95.5	33.5	9.0
MENA (excl. GCC)	633.7	0.1	0.3	7.7
Sub-Saharan Africa	20.1	1.3	1.8	0.6
Others	54.4	9.4	17.0	0.3
Total	1,476.2	294.7	75.8	21.4

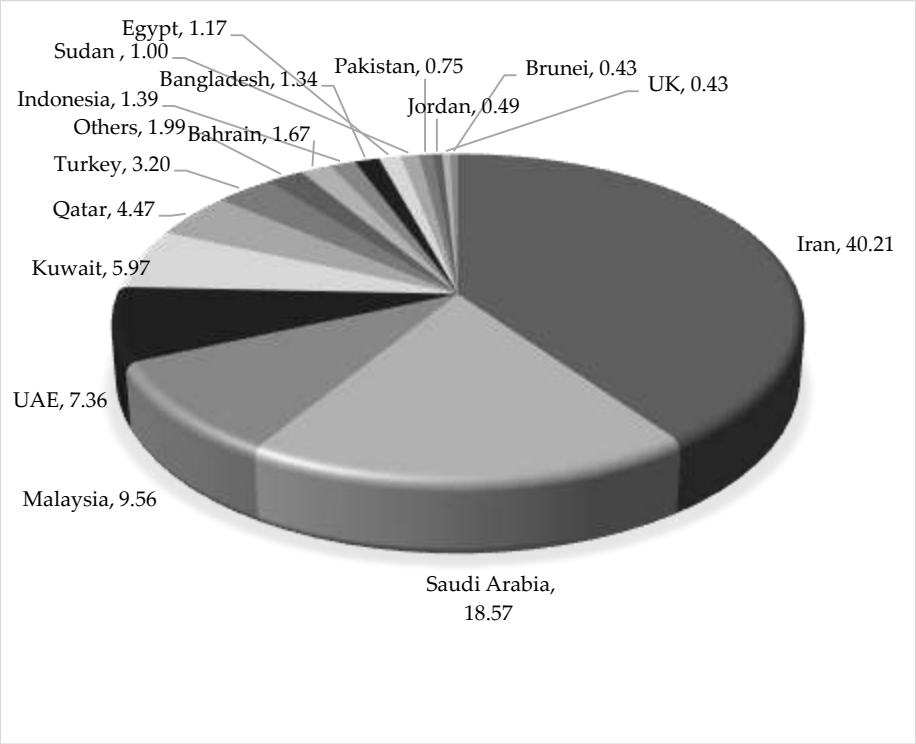
Source: IFSB (2015)

Currently, according to Islamic Financial Services Board (IFSB) a total of 16 countries host Islamic financial services. These countries are Afghanistan, Bahrain, Bangladesh, Brunei Darussalam, Egypt, Indonesia, Iran, Jordan, Kuwait, Malaysia, Nigeria, Oman, Pakistan, Saudi Arabia, Sudan and Turkey. As of 2014, total asset size of global Islamic banking is about 1.48 trillion USD. According to the data compiled by Hussain, Shahmoradi and Turk (2015), the total asset size of Islamic finance (comprising banking and non-banking financial institutions) displayed a significant growth since mid-

2000's and rose from around 400 billion USD in 2006 to almost 1.9 trillion USD by 2014. From this data we can see that Islamic finance is mainly bank based.

Investigating IFSB'S data, it is seen that almost 81%of the banking industry concentrated in the Middle East North and America (MENA) and Gulf Cooperation Council (GCC) countries. Moreover ISFB (2015) reports that Iran's banking industry dominates global Islamic banking assets with a share of around 40%, where the whole banking system is fully Islamic.

Figure 1: Shares of Global Islamic Banking Assets (as of July 2014)



Source: IFSB (2015)

However, while Iran and Saudi Arabia dominates the global Islamic banking industry, a significant acceleration is observed in countries outside the MENA region in countries. Hussain, Shahmoradi and Turk (2015) points out that "*..with more Muslim populations, but most of the industry's growth in the MENA region was led by GCC countries. In particular, the Islamic finance industry grew, on average, by 43 percent in Indonesia, and by 19 percent in Turkey during 2009–13*". This fact may be attributed to the increased commodity prices helping GCC countries to get more financially involved with other Muslim economies. But also another factor may be the global crisis environment paving a way for a relatively stable and sound bank business model.

Looking at several structural indicators (complied by IFSB from data providing 15 countries), it can be seen that the total number of Islamic banks and Islamic banking windows have reached to 242 institutions, operating with 32,354 branches. This indicates a significant increase considering the aforementioned recent history. In parallel, total number of personnel is reported as around 510 thousand.

Table 2: Selected Aggregated Islamic Financial Indicators

Indicators	Currency	Unit	2013	2014
Total assets	*USD*	*Billion*	1,200	1,308
Total *Sharī`ah*-compliant financing	*USD*	*Billion*	651	688
Total funding/liabilities	*USD*	*Billion*	962	1,084
Number of Islamic banks and Islamic banking windows			238	242
Number of domestic branch offices			32,096	32,354
Number of employees			504,098	513,059

Source: PSIFIs countrywise data.

Note: The aggregated data for total assets (15 countries), total Sharī`ah-compliant financing (15 countries), total funding/liabilities (14 countries), and total revenues (13 countries) are calculated from available countrywide structural data from Islamic banks and Islamic banking windows of conventional banks, converting into U.S dollar terms, at the end period exchange rates.,

While Islamic banking showed a strong global growth performance, compared to conventional commercial banking, it still remains considerably small. The total asset size of the global Islamic banking can only match to the total asset size of a single bank, namely ING Bank, ranking as 21st on the biggest global banks. Hence, financial industry's current structure indicates a tough competition for Islamic banking services. But on the other hand, International Organization of Securities Commissions predicts that as much as half of the savings of 1.2-1.6 billion Muslims would be directed to Islamic financial institutions by 2015 (Imam and Kpodar, 2010).

3. Principles of Islamic Banking

One major reason attributed to the stability of Islamic banking compared to conventional banking business is the "nature" of Islamic banking, which differs from conventional banking. To have an overall understanding of this differentiated "nature", the key principles of Islamic finance and banking needs to be discussed.

As a definition "Islamic finance and/or banking" refers to relatively broad and geographically diverse field. Fundamentally it refers to a process of financial transactions, from beginning to end, which complies with Islamic law, *Shari'ah* legal code, and basically transactions of interest free nature. This broad definition causes a diversified implementation between regions, countries etc.. While Islamic banking refers to managing a financial process according to/in line with Islamic rules, the differentiation

from conventional banking reveals itself from another point. Hasan and Dridi (2010) points out the fundamental difference in the field of risk transfer and risk sharing. The financial intermediation function, which is based on assets, in Islamic banking is based on risk sharing/participation. In conventional banking the financial intermediation is generated from debt based activities and risk transfer. This issue must be underlined as the great divide. Moreover, restrictions on speculative transaction due to Islamic rules, limit the complexity and variety of financial instruments. These features already bring Islamic banking to a more stable and sound line of business (there is a question of loss of efficiency in terms of economies of scope and scale stemming from this divide for more on this discussion on global see Beck, Demirgüc-Kunt, and Merrouche (2010), for Turkish case see Sakarya and Kaya (2013))

Table 3: Risk Sharing in Islamic Banking and Risk Transfer in Conventional Banking

Risk Sharing in Islamic Banking	Risk Transfer in conventional (Commercial) Banking
Sources of funds: Investors (profit sharing investment account (PSIA) holders) share the risk and return with Islamic Banks. The return on PSIA is not guaranteed and depends on the banks' performance.	Sources of funds: Depositors transfer the risk to the conventional banks, which guarantee a pre-specified return.
Uses of funds: Islamic Banks share the risk in Mudharabah (*mudaraba)* and Musharakah (*Müşaraka)* contracts and conduct sales contracts in most other contracts.	Uses of funds: Borrowers are required to pay interest independent of the return on their project. Conventional Banks transfer the risk through securitization or credit default swaps. Financing is debt-based.

Source: Hasan and Dridi (2010)

Chong and Liu. (2009) considers both type of financial intermediary institutions (Islamic and conventional) ultimately as profit maximizing firms, thus having many common traits. These intermediaries reduce information asymmetries, increase efficiency in resource allocation, decrease transaction costs and assist diversifying small savers and investors. That's how they should be analyzed. Hence through this lens, the similarities yield that these two financial intermediation models are compatible. The main reason for that is the market competition drives profit maximizing firms to conduct in similar ways in the line of financial intermediation. According to Chong and Liu. (2009), that's why the convergence of profit loss sharing (PLS) rates and interest rates are observed.

However pricing might not be the crucial parameter. Considering a stylized Islamic bank balance sheet a difference in bank business model can be seen. In Islamic banking business one major instrument is *mudârabah.* Muḍârabah is a partnership contract between the capital provider (Rabb-Al-Mal) and an entrepreneur (*Muḍârib*) whereby the capital provider would contribute capital to an enterprise or activity that is to be managed by the entrepreneur. Profits generated by that enterprise or activity are shared in accordance with the percentage specified in the contract, while losses are to be borne solely by the capital provider unless the losses are due to the entrepreneur's misconduct, negligence or breach of contracted terms (IFSB, 2015:). Hence in mudârabah, a bail-in system is place by definition.

Table 4: Stylized Islamic Bank Balance Sheet

Assets	**Liabilities**
Cash and liquid securities	Demand deposits (qard al hasan, wakala)
	Interbank murâbaḥah
Interbank murâbaḥah	Unrestricted profit sharing investment accounts (mudârabah)
Inventory (real estate, automobiles, commodities, etc.) Asset-backed transactions (murâbaḥah, ijārah,salam, and istisna)	*Restricted profit-sharing investment accounts (mudârabah) 1/*
PLS transactions (mudârabah, musharakah)	Reserves (PER, IRR)
Fee-based services (wakalah, kafalah) 2/	Shareholders' equity capital

Source: Hussain, Shahmoradi, and Turk (2015)
1/ Restricted profit sharing investment accounts are generally included off-balance sheet.
2/ Fee-based services include letters of credit, letters of guarantee, safekeeping of negotiable instruments and the collection of payments, internal and external transfer operations, hiring coffers, administration of real estate or projects, and administration of wills. Most of them are generally included off-balance sheet.

4. Islamic Banking and Financial Stability

The (stylized) Islamic bank balance sheet and the nature of financial intermediation based on risk participation makes a strong case for financial stability. Financial stability has many definitions to it. It is a broad concept, encompassing the different aspects of finance (and the financial system)—infrastructure, institutions and market, as Schinasi (2004:06) points out. Thus financial stability depends

on several factors. And one major factor can be defined as the micro prudential factor. Micro prudential perspective is such a perspective that even without the notion systemic risk (or macro prudential perspective), it remains as an objective. So, basically, maintaining financial soundness of individual financial institutions serves both micro prudential and macro prudential goals in post global crisis understanding of financial stability.

Islamic banking provides a relatively simple and straight forward model which facilitates micro prudentiality that fosters financial stability. Risk participation model in financial intermediation is one component. The interest free financial instruments induce a less leveraged, equity based financial intermediation. Shaping a relatively equity weighted liability structure

Another factor is that Islamic rules dictate relatively less-complex financial instruments. This keeps Islamic financial institutions less complex, less interconnected and smaller for that matter. Thus with all these qualities Islamic financial institutions (banks) make half way through solving the SIFI[1] issue. At least Islamic banks seems to be already in line with recent global structural reform initiatives such as Volcker Rule, Liakanen Report and Vickers Proposal, which basically separates (or ring fences) investment banking activities and deposit banking activities to support soundness, ease the resolution process and limit costs of probable bank failures on public.

While these main factors contribute soundness/resilience of Islamic banks, and to the (micro) prudential aspect of financial stability for that matter, there are also several drawbacks of risk sharing. Čihák and Hesse (2008) indicates that "*..the PLS financing shifts the direct credit risk from banks to their investment depositors, but it also increases the overall degree of risk on the asset side of banks' balance sheets, as it makes Islamic banks vulnerable to risks normally borne by equity investors rather than holders of debt*." Hence the pricing of risk in Islamic banking becomes a question. The connection between participation and collateralization becomes an issue. For example in mudârabah, the bank provides the capital needed for financing a given project. The entrepreneur offers labor and expertise. The PLS of the project is shared

[1] SIFIs (Systemically Important Financial Institutions) are financial institutions whose distress or disorderly failure, because of their size, complexity, systemic interconnectedness and substitutability, would cause significant disruption to the wider financial system and economic activity (see FSB, 2011).

between the bank and the entrepreneur at a decided ratio. So the financial losses are taken by the bank. The liability of the entrepreneur is his labor and time. This type of risk sharing may also incentivize moral hazard.

Another specific risk inherent in Islamic banks stems from the special nature of investment deposits, whose capital value and rate of return are not guaranteed. Some of the authors quoted above argue that this increases the potential for moral hazard, and creates an incentive for risk taking and for operating financial institutions without adequate capital

Another area is the limited use of hedging instruments as Islamic rule may forbid use of these, therefore management of market risks may come at higher costs (direct and/or indirect) . Moreover in some cases absence of such tools may increase vulnerabilities.

Overall, Islamic banking model provides a relatively direct financial intermediation with risk sharing at its core. The limitations borne by Islamic rules imply a simple yet more equity based (less leveraged) banking business. Thus, this model is praised as it excludes the culprits of Global Crisis.

5. Empirical Studies on Islamic Banks

The theoretical proposition of equity based intermediation of financing to real activities being intrinsically more stable have been an issue for empirical studies as well. Especially following the Global Crisis this theoretical proposition was somewhat supported by mere observation, as the contagion of the Global Crisis was limited to world of Islamic finance. Moreover with the increase in the interest on Islamic finance stemming from an increased overall awareness, the strong accumulation of wealth in Islamic countries, increased demand to Islamic finance products and increase in financial instruments, draw considerable attention to Islamic banking and its empirical investigation.

The empirical studies on bank soundness are carried out through two major veins. The first one is the performance. Bank performance analysis is critical in maintaining a sound business. Weaknesses in performance and efficiency for that matter are likely to lead instabilities. Haron (1996), Bashir (2000)

and Beck, Demirguç-Kunt and Meriouche (2013) may be cited for investigating performance and efficiency in international cases and Parlakkaya and Çürük (2011) and Sakarya and Kaya (2013) may be cited for a recent analysis for Turkish banking system. While regional or international studies are usually based on peer group analysis considering Islamic banking and conventional banking models as distinctive peers. Local market studies such as Sakarya and Kaya (2013) are more granular, bank based studies. Demirgul-Kunt and Meriouche (2013) find that Islamic banks are more cost-effective in a general sense, but in markets where both Islamic and conventional banks exist, conventional banks are more cost-effective due to diversification. Sakarya and Kaya (2013) concludes that, while Islamic banks operate with higher share of equity, and focus more on traditional function of financial intermediation, they do not display any difference in efficiency and profitability (performance),

The second vein of empirical research on Islamic banks is the Z-score and GARCH models. These type of studies the z-score has become a popular measure of bank soundness (Beck, Demirgüç-Kunt and Merrouche, 2013; Čihák and Hesse, 2008). While Z-score used in Demirgüç-Kunt and Meriouche (2013) differ from others that apart from stability different business models are also investigated by using balance sheet data are from Bankscope , on a yearly based sample covering 1995-2007, fovcusing on pre-crisis period and structure .

Čihák and Hesse (2008) investigates the financial stability of Islamic and conventional banks. All relevant were again collected data from bank-scope database. The study covers 77 Islamic banks and 397 conventional banks over a period of 1993 to 2004. Once more a pre-crisis period.

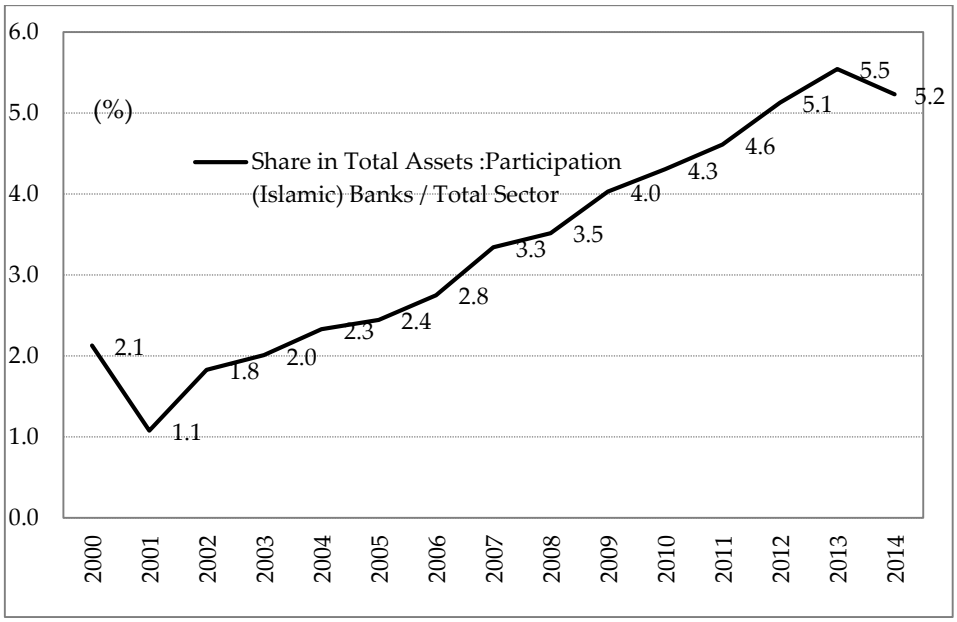
These two major studies have inspired many domestic market analysis. Rahim and Zakaria (2013) employed z-score model to find out whether Islamic banks were less or more stable than conventional banks for Malaysia. Rahji and Hassari (2013) also employ z-score analysis to compare Islamic banking between MENA and Southeast Asia region. Gamaginta and Rokhim (2015) provide an analysis for Indonesia. Ghassan and Fachin (2015) investigates Saudi Arabia and Pradhan (2014) analyzes India for financial stability.

Such domestic banking sector analysis add significant value to the higher understanding of this issue. First off the data quality is considerably higher. More granular, and hand on data provides more reliable results and inference. Second, the control variables are going to be symmetric for all individual banks. Moreover, Islamic banking stability is also a parameter for financial market stability. Higher the share of Islamic banking it is expected to affect overall market soundness. As seen on ISFB (2015) data, the share of Islamic finance in a given economy varies. Thus this would create causality issues when dealt with broader scoped international analysis. Naturally regional or international studies contribute in a different perspective. Thus in this study Turkish banking sector is studied in a bank based, z-score model to investigate financial stability of Islamic banks.

6. Islamic Finance in Turkey

Islamic finance which has more than 40 years of international history, has a 30 years of background in Turkey. Islamic finance in Turkey dates back to 1983 with the establishment of "special finance institutions" by the Decree of Ministry of Councils numbered (83/7506). Later of these institutions have been defined as "Participation banks" with an amendment to the new Banking Act Nr. 5411 in 2005. These institutions are described as institutions that are licensed to provide all banking services according to Islamic finance principles.

Figure 2: Share of Participation (Islamic) Banks in Turkish Banking System

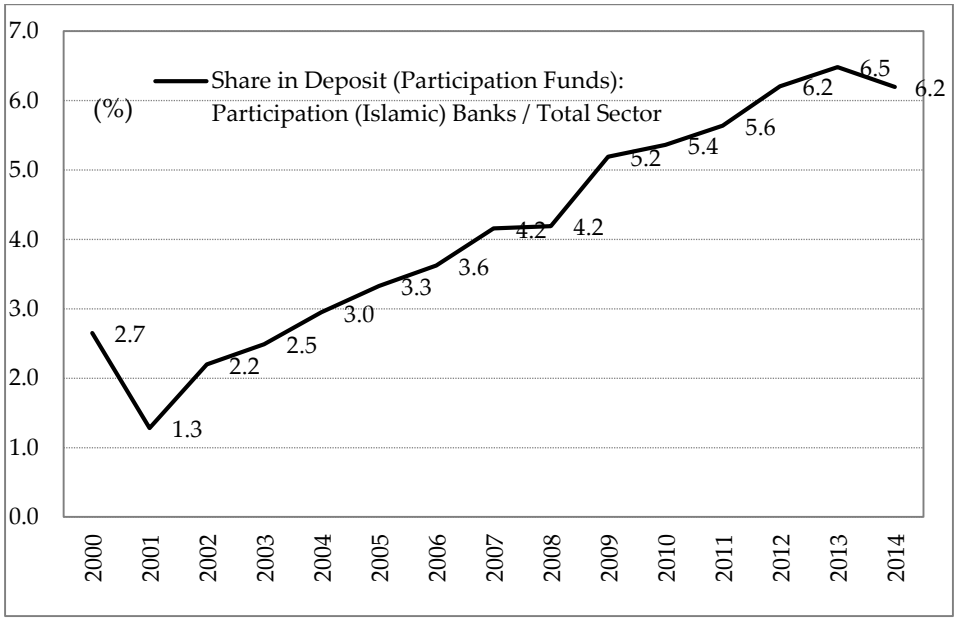


Source: BRSA, PBAT(TKBB)

The total assets of Islamic banks in Turkey showed a remarkable growth performance especially during the post 2000-2001 Turkish financial crisis period. During 2002-2014 period average annual growth rate of the asset size for these banks is almost 29% where the overall banking sector's is 18.5%. However, even with this exceptional growth the share of Islamic banks in Turkish banking system has reached at 5.2% by the year end 2014.

The share of participation funds in total deposits of the sector is higher compared to the share in assets. This is simply attributable to the fact that as a significant saving unit of the Turkish economy system, households with relatively higher religious concerns, tend to direct their savings to Islamic banks, while (private) corporate sector seeks loans from every possible source.

Figure 3: Share of Islamic Banks' Participation Funds in Total Deposits

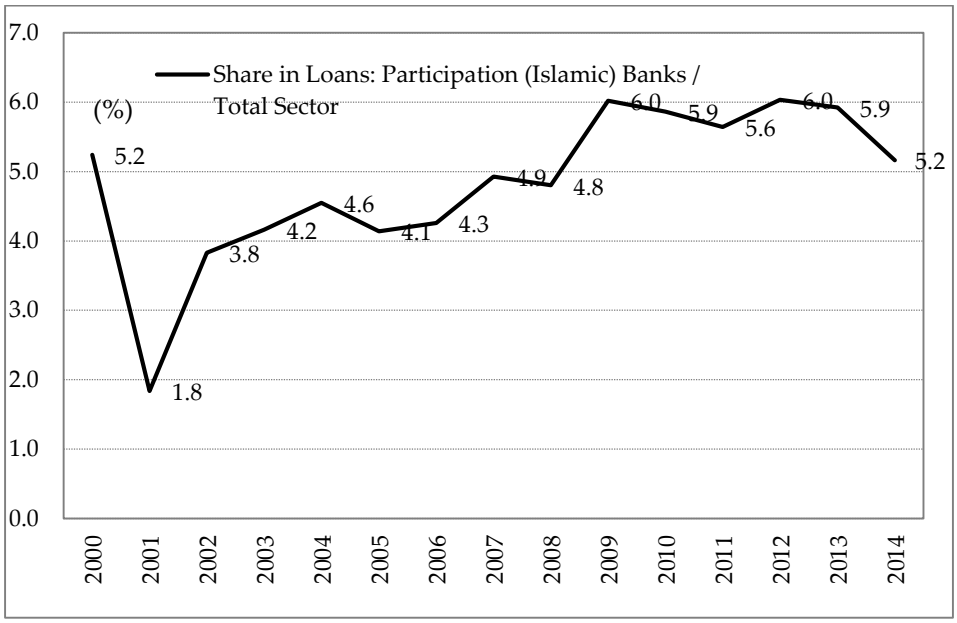


Source: BRSA, PBAT(TKBB)

Hence looking at participation banks' share in loans in Turkey, an abrupt shift is observed during 2002-2003 period. From this period onward, the increase in this market share displays somewhat a relatively horizontal progress. This is mainly due to the increased financial deepening in Turkey, following the Turkish banking restructuring program and attained economic and political stability. These factors boosted retail banking by 2003, increasing household and corporate debt.

Nevertheless looking at Islamic banks share in loans and participation funds (deposits) one can easily observe that they are both around 6% (despite a drop in the share of loans in 2014) and higher than their share in total assets. This may be evaluated as an indication of Islamic banks focus on traditional financial intermediation.

Figure 4: Share of Islamic Banks' Loans in Total Loans



Source: BRSA, PBAT(TKBB)

The increased interest towards Islamic finance at global scale is also valid for Turkish case. Moreover Turkish Islamic banking is being cited for its favorable financial environment as well as political support in supporting the development of Islamic finance domestically (see Standard&Poors, 2015, Kammer et.al, 2015 and IFSB; 2015). As mentioned above, Islamic banking in Turkey grew with a stronger pace in an ever growing industry despite the global financial crisis since 2002. A significant differentiation can be observed in the average annual growth rate of total assets and deposits (participation funds), while lending is exceptionally robust in both Islamic and conventional, deposit banks.

Table 5: Loans, Deposits and Total Assets of Islamic Banks and Deposit Banks

Year	Total Assets			Total Loans			Total Deposits (Part. Funds)		
	Sector	Deposit Banks	Participation Banks	Sector	Deposit Banks	Participation Banks	Sector	Deposit Banks	Participation Banks
2003	17.4	12.6	32.9	35.2	37.0	46.8	12.6	12.6	27.4
2004	22.7	23.0	45.4	50.0	53.4	64.1	23.0	23.0	45.7
2005	32.8	27.2	10.0	57.4	53.1	43.2	31.6	27.2	48.5
2006	22.8	22.0	38.3	40.0	40.6	44.0	22.3	22.0	33.2
2007	16.4	15.4	41.4	30.4	29.7	50.9	16.0	15.4	33.0
2008	26.0	27.3	32.5	28.6	28.8	25.4	27.4	27.3	28.4
2009	13.9	12.0	30.5	6.9	5.1	34.0	13.2	12.0	40.3
2010	20.7	19.7	28.9	33.9	34.8	30.4	19.9	19.7	23.9
2011	21.0	12.4	29.6	29.9	29.7	25.0	12.7	12.4	18.5
2012	12.6	10.4	25.2	16.4	15.3	24.5	11.0	10.4	22.2
2013	26.4	22.1	36.7	31.8	31.2	29.3	22.5	22.1	27.9
2014	15.1	11.6	8.6	18.5	19.1	3.3	11.3	11.6	6.4
2002-2014 Avg.	20.5	20.0	29.5	30.9	30.8	*34.2*	18.5	17.8	29.1

Source: BRSA, PBAT(TKBB)

While Islamic banks in Turkey outpaced deposits banks in terms of growth rates, their stability and profitability measures displayed somewhat a parallel development with the industry. This is mainly attributed to the fact that domestic economic and financial climate where deposits banks have also switched to traditional financial intermediation function, and the fact that Islamic banks are less leveraged. Moreover deposit banks have also utilized other sources of income generation with the availability of a wider range of (interest based) financial instruments.

Table 6: Selected Financial Stability Ratios of Islamic Banks and Deposit Banks

Year	Capital Adequacy Ratio			Return on Assets			Return on Equity		
	Sector	Deposit Banks	Participation Banks	Sector	Deposit Banks	Participation Banks	Sector	Deposit Banks	Participation Banks
2003	25.1	22.9	N/A	16.4	14.4	N/A	135.6	129.0	N/A
2004	30.9	28.2	N/A	2.5	2.4	N/A	18.1	19.0	N/A
2005	28.2	26.2	12.0	2.4	2.3	N/A	15.8	16.9	N/A
2006	23.7	21.6	12.5	1.7	1.5	3.5	12.1	11.8	36.9
2007	21.9	19.9	16.5	2.6	2.5	3.3	21.0	22.2	30.8
2008	18.9	17.4	16.1	2.8	2.7	3.1	24.8	26.6	30.7
2009	18.0	16.5	15.2	2.0	1.9	2.8	18.7	19.9	24.1
2010	20.6	19.3	15.3	2.6	2.6	2.4	22.9	25.2	19.0
2011	19.0	17.7	15.1	2.5	2.5	2.0	20.1	22.2	16.9
2012	16.6	15.5	14.0	1.7	1.7	1.6	15.5	16.8	14.8
2013	17.9	17.2	13.9	1.8	1.8	1.5	15.7	16.8	14.7
2014	15.3	14.6	14.0	1.6	1.6	1.3	14.2	15.1	13.8

Source: BRSA

Hence, the return on assets and return on equity ratios of Islamic banks are around 1.3% and 13.8%, respectively in 2014. These figures are 1.6% and 15.1% for the deposit banks. Looking at the above table its seen that during 2006-2009 period Islamic banks profitability ratios are higher than those of deposit banks. Both type of banks have enjoyed significantly high profitability figures since restructuring period. As 2012, the profitability figures of Turkish banking industry had a minor setback, due to the domestic policy changes as well as global factors. However the recent figures are still exceptionally competitive in global sense.

Same may be told for the capital adequacy ratios (CAR) of Turkish Islamic banks. The amendments in the regulatory framework induced a higher CAR for Islamic banks by 2006. Hence their CAR remains substantially higher than international standards as well as domestic requirements (14% as of 2014).

Table 6: Selected Financial Stability Ratios of Islamic Banks and Deposit Banks

Year	Net FX Positon/Own Funds			Non-Performing Loans/Total Loans			Liquidity Ratio		
	Sector	Deposit Banks	Participation Banks	Sector	Deposit Banks	Participation Banks	Sector	Deposit Banks	Participation Banks
2003	N/A	N/A	N/A	17.5	18.6	N/A	N/A	N/A	N/A
2004	0.5	0.3	-25.7	11.5	12.1	N/A	N/A	N/A	N/A
2005	-0.2	-0.4	2.2	6.0	6.2	N/A	N/A	N/A	N/A
2006	-0.2	-0.5	4.8	4.7	4.9	4.1	N/A	N/A	N/A
2007	0.3	0.3	-4.1	3.7	3.8	3.5	N/A	N/A	N/A
2008	0.3	0.1	4.7	3.5	3.6	3.4	168.5	167.1	238.9
2009	-0.1	-0.4	4.2	3.7	3.7	4.4	166.9	165.3	215.3
2010	0.5	0.6	1.1	5.3	5.4	4.7	169.5	167.9	232.4
2011	0.1	0.0	0.6	3.7	3.7	3.5	165.1	162.6	238.3
2012	0.4	0.4	0.6	2.7	2.7	3.1	151.8	150.1	204.7
2013	2.0	2.3	0.5	2.9	2.9	3.0	157.1	155.8	194.9
2014	-0.6	-0.6	-0.3	2.7	2.8	3.4	146.5	145.5	174.3

Source: BRSA

One other notable issue is that Islamic banks' loan loss ratio (non-performing loans/total loans) is a notch higher than the sectoral average. This is once again an expected result in focusing on financial intermediation.

7. Data and Analysis

An important feature of the z-score is that it is a fairly objective measure of soundness across different groups of financial institutions. It is an objective measure because it focuses on the risk of insolvency, i.e., on the risk that a bank (whether commercial, Islamic, or other) runs out of capital and reserves. The z-score applies equally to banks that use a high risk/high return strategy and those that use a low risk/row return strategy, provided that those strategies lead to the same risk-adjusted returns. If an institution "chooses" to have lower risk-adjusted returns, it can still have the same or higher z-score if it has a higher capitalization. In this sense, the z-score provides an objective measure of soundness.(Čihák and Hesse; 2008)

The definition of Z-score is as follows:

$$P\left(ROA_{it} \leq -\frac{EQ_{i,t}}{A_{i,t}}\right) \leq \frac{\sigma^2_{ROA_{i,t}}}{\left(\mu ROA_{i,t}+\frac{EQ_{i,t}}{A_{i,t}}\right)^2} \equiv \frac{1}{Z^2_{i,t}} \qquad (1)$$

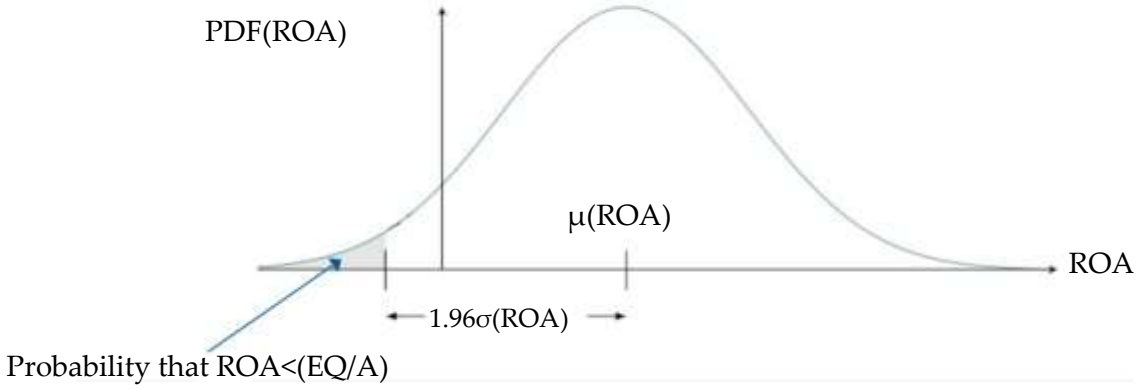
The value of *Z* in the above expression corresponds with the probability of insolvency risk. Assuming that the ROA_{it} is normally distributed, the Z-Score is defined as a bank default probability indicator (Boyd and Graham, 1986).

The Z-Score is defined (Boyd and Graham, 1986), under mild assumptions, as the number of the standard deviations of the return on assets necessary to wipe out equity capital. But even if ROA_{it} is not normally distributed, Z is the lower bound on the probability of default so that a higher value of Z-score implies a lower probability of insolvency (Čihák and Hesse, 2008). Based on the above explanation, the Z-score is calculated with the following equation:

$$Z_{i,t} = \frac{\mu ROA_{i,t}+\frac{EQ_{i,t}}{A_{i,t}}}{\sigma^2_{ROA_{i,t}}} \qquad (2)$$

where Z_{it} is a proxy variable for the probability of insolvency of the bank *i* at time *t*, ROA_{it} is the ratio of return on assets of bank *i* at time *t*, EQ_{it}/A_{it} is the amount of equity to assets ratio of bank *i* at time *t*, and μ_{ROAit} is the rate of return on assets of of bank *i* at time *t*,

Figure 5: Z-Score Definition



A variety of options to compute the Z-Score has been surveyed and compared in Lepetit and Strobel (2013), using a panel of banks for the G20 group of countries covering the period 1992–2009. They examine different approaches best fit the data, using a simple root mean squared error criterion. Their results support a time-varying Z-score measure, using mean and standard deviation estimates of the return on assets calculated over full samples combined with current values of the capital-asset ratio.

While there are several definitions to calculate the Z-Score for time varying panels, when analyzing a given sovereign market, it would be preferable to use a definition appropriate for given banking industry where the distribution of ROAs might display structural differences across peer groups.

The empirical part of the study is to test, using regressions of z-scores as a function of a number of banks specific, sector specific and macroeconomic and variables, whether Islamic banks are less or more stable than commercial banks in Turkey. In this study to measure the bank risk and soundness,

regressions of z-scores as a function of numbers of variables are used. Čihák and Hesse (2008), utilizes regressions of z-scores as a function of a number of variables to test whether Islamic banks are less or more stable than conventional banks. Here, a modified version of this approach is implemented to test Turkish conventional and Islamic banking systems. The general form of the estimation equation is follows;

$$z_{i,t} = \alpha + \beta B_{i,t-1} + \gamma I_{t-1} + \sum \delta_s T_s + \sum \phi_s T_s I_t + \sum \varphi_s B_{i,t-1} T_s + \varpi M_{t-1} + \varepsilon_{i,t} \qquad (3)$$

Equation (3), dependent variable is z-score $Z_{i,t}$ for bank i at time t; $B_{i,t}$ is a vector of bank-specific variables; I_t contains time-varying industry-specific variables; T_s and $T_s I_t$ are the type of banks and the interaction between the type and some of the industry- specific variables; M_t is the vector of macroeconomic variables, and $\varepsilon_{i,t}$ is the residual.

Given this framework, this study focuses on Turkish banking system with the data collected from BRSA, BAT (The Banks Association of Turkey) and PBAT (Participation Banks Association of Turkey). The data coverage is between years 2005 and 2014. According to the data collection and compilation process, 42 banks are included in the analysis. Of these 42 banks, 4 of them are participation (Islamic banks). Rest of the sample is comprised of conventional, deposit banks. As mentioned earlier, there have been even an increased interest in Islamic banking in Turkey, and especially since 2013, several state owned banks applied for establishment of Islamic banks of their own. These *de novo* licenses were granted, however since 2015 they have not been fully active in the market. Hence this analysis only covers participation banks that were active in 2005-2014 period. Moreover, one of the banks included in the analysis was, first intervened by the regulatory and supervisory authority and then transferred to the Saving Deposit Insurance Fund according to the article 71 section (b) of Banking Act No:5411[2].

[2] According to this article no 71 [Revocation of operating permission or transfer to the Fund], "In case the *(Banking Regulation and Supervision)* Agency determines, as a result of supervision, that… (b) The continuation of the bank's activities will endanger the rights of the owners of depositors and participation funds as well as the security and stability of the financial system, ….The *(Banking Regulation and Supervision)* Board shall be authorized, with the affirmative votes of minimum five Board members, to revoke the operating permissions of that banks or to transfer the shareholder rights except dividends and the management and supervision of the banks to the Fund, for the purposes of transferring, selling or merging them partially or fully, on the condition that the loss will be de- ducted from the capital of the existing partners…

When constructing the estimation equation according to Turkish banking sectors specifics, equation (3) was utilized and for bank specific control variables such as asset size, loan / assets (for a measure of asset composition and focus on financial intermediation as well), cost / income (for cost efficiency) has been included. These financial indicators are also widely used in literature. Moreover, to control for differences in the structure of the bank's income, a measure of income diversity is included Demirgüç-Kunt and Merrouche (2013) and Sakarya and Kaya (2013) uses this income diversity in an efficiency based analysis of Islamic banking, as to the contribution of possible economies of scale in times of re-regulation is on way in financial markets.

From the Z-Score perspective, to differentiate the bank type (Islamic vs conventional) on Z-Score, a dummy variable that takes the value of 1 if the bank in question is an Islamic bank, and 0 otherwise (i.e., if it is a commercial bank) a la Čihák and Hesse (2008). Thus, if Islamic banks are relatively sound than commercial banks, the dummy variable would have a positive sign in the regression explaining z-scores.

Table 7: Descriptive Statistics for Calculated Z-Scores

	Total	Conventional	Islamic
Mean	10.919	6.461	11.467
Median	6.558	5.840	6.681
Maximum	85.802	15.139	85.802
Minimum	-0.917	1.723	-0.917
Std. Dev.	12.544	3.740	13.127
Skewness	2.983	0.944	2.811
Kurtosis	13.569	3.068	12.224
Jarque-Bera	2240.204	5.947	1580.165
Probability	0.000	0.051	0.000
Sum	3985.3	258.4	3726.9
Sum Sq. Dev.	57271.8	545.5	55833.5
Observations	365	40	325

Source: Author's calculations.

For macroeconomic variables, to keep things rather plain and simple two major indicators are included. First one is GDP growth rate, to capture both growth in deposit base, and from expenditure side domestic demand developments. The remaining macroeconomic variables are generally taken as inflation rate and usually as exchange rate depreciation. However, for Turkish case considering the sample period, rather than using inflation rate, overnight rate, is chosen. This way both the monetary policy stance and nominal pricing behavior might be captured.

A first look at the Z-Scores suggests a significant variability in the sample, with a Z-Score varying from – 0.917 to 85.802. The average is 6.461 for conventional banks with a maximum of 15.139. The average for Islamic banks is of 11.61 with a maximum of 85.802. While these pairwise comparison of z-scores between banks are useful, for bank based differences in soundness, this might fail short to provide an explanation of variation in Z-Scores. However the basic data still suggests that Islamic banks may be more stable than commercial banks, having higher mean value. To differentiate the financial stability impact of the Islamic banking from the conventional banking, and from macroeconomic and other system-level influences, several regression analyses were applied, following the methodology in equation (3). The variables used in these analyses are reported below:

Table 8: List of Variables

Variable	Description	Mean	Std. Dev.	Maximum	Minimum
ZSKO	Z-Score	10.919	12.544	85.802	0.917
CTI	cost -to-income	97.614	688.490	13,144.170	1,146.665
ETA	equity / total assets(liabilities)	20.307	20.223	98.895	3.927
GDP	log(Gross Domestic Product)	4.307	4.114	9.157	4.826
INCDIV	Diversification Ratio	0.773	0.245	0.999	1.816
ISLMDUM	Islamic Bank Dummy	0.110	0.313	1.000	0.000
LEQ	Log(Equity)	13.583	1.802	17.193	9.086
LFA	Log(Fixed Assets)	11.474	2.455	16.265	5.930
LFI	Log(Fee Income)	11.147	2.424	15.203	2.944
LNDEF	Log(Non-Deposit External Funds)	14.090	2.360	18.223	5.852
LOANTOAS	Loan / Assets	45.126	23.342	79.310	0.000
LOANTODEP	Loan / Deposits (Participation Fund)	1,726.436	19,166.820	348,534.200	0.000
LOGNLA	Log(Non-Loan Rev. Gen. Assets)	14.373	1.901	18.255	9.883
LOGTA	Log(Total Assets)	15.456	2.156	19.327	10.149
LOGNONDEPFUND	Log(Non-Deposit Funds)	14.694	1.930	18.528	10.110
MSH	Market Share	2.739726	4.24094	16.5084	0.0027
ONR	Overnight Rate	10.004	5.190	17.245	2.999

Source: BRSA, Bloomberg, BAT, PBAT and author's calculations.

Diversification Ratio (INCDIV) is defined as $1 - \left[\frac{Net\ Intrest\ Income - Other\ Operating\ Income}{Total\ Operating\ Income}\right]$

As evident from the list of variables several specifications of the main regression model have been run. These are all specifications in search for capturing bank balance sheet behavior differences and indicators of market structure that is suspected to have effect on stability. However the main structure remains the same. A regression of Z-Scores on bank specific, industry specific and macroeconomic variables. Generally, bank specific variables are used as total asset size, loan to assets, cost to income and diversification ratio. Asset size and loan to assets are calculated from balance sheet which would provide information on banks portfolio choices. Thus variables like Non-Loan, Revenue Generating assets and fixed assets are variables from the same vein, describing an asset composition for a given bank. Likewise for the liabilities side non deposit external funds variable, equity to total liabilities gives alternative approaches to bank specific concerns. For industry specific indicators market share variable in interaction with Islamic bank dummy is utilized. And as noted earlier, the macroeconomic variables are GDP growth and overnight rate.

Specification 1 in the summary results table indicates the base regression model, while specification 5 is the broadest specification. Looking at base model results, this confirms the pairwise comparison of Z-Scores of Islamic banks and conventional banks in Turkey.

Table 9: Summary Results

	Spec. (1)		Spec. (2)		Spec. (3)		Spec. (4)		Spec.(5)	
	Coef.	P.val.	Coef.	P.val.	Coef.	P.val.	Coef.	P.val.	Coef.	P.val.
C	65.689	0.000	66.293	0.000	66.293	0.000	55.608	0.000	56.522	0.000
LOANTOAS(-1)	-0.151	0.007	-0.184	0.001	-0.184	0.001	-0.176	0.002	-0.197	0.000
CTI(-1)	0.000	0.060	-0.001	0.011	-0.001	0.011	0.000	0.087	0.000	0.087
LOGTA(-1)	-2.415	0.000	-2.254	0.000	-2.254	0.000	2.331	0.003	2.422	0.003
LOANTODEP(-1)			0.000	0.001	0.000	0.001	0.000	0.013	0.000	0.511
LAD(-1)			0.000	0.000	0.000	0.000			0.000	0.000
LNDEF(-1)							-4.458	0.000	-4.486	0.000
INCDIV(-1)	0.413	0.848	-0.990	0.679	-0.990	0.679	1.570	0.493	0.769	0.718
ISLMDUM(-1)	5.875	0.029	7.034	0.009	7.034	0.009	-3.774	0.240	-2.967	0.349
ISLMDMSH(-1)	-5.433	0.003	-5.978	0.002	-5.978	0.002	0.319	0.872	-0.108	0.957
ONR(-1)	-0.762	0.000	-0.785	0.000	-0.785	0.000	-0.767	0.000	-0.785	0.000
GDP(-1)	-0.667	0.000	-0.662	0.000	-0.662	0.000	-0.591	0.000	-0.590	0.000
Obs.		323		323		323		323		323
R2		0.308		0.332		0.342		0.376		0.389

Source: Author's calculations.

The sign of the Islamic dummy variable is positive and significant in the specifications (1), (2) and (3). Moreover the interaction variable of market share and dummy is significant and negative in these specifications. Thus this implies a conclusion of smaller Islamic banks being even more stable and sound. This result is in parallel with results of Čihák and Hesse (2008) Rahji and Hassari (2013).

The logged bank's asset size is on average negatively related to bank stability in the all estimation specifications. This is mainly attributable to the overall soundness of Turkish banking system in the research period. Hence the larger banks as leaders in the industry, may be exposed to lower levels of profitability due to (costly) efforts of protecting the market penetration as well as new product developments and promotion.

One interesting result is that the coefficient of cost to income ratio is significant, while being significantly small. Additionally, the coefficient on diversification ratio is found to be insignificant in all specifications.

These results in these analysis also indicated that GDP growth rate has negative relationship with banks' stability. This is contradictory to theory and overall expectations. However, considering the prudential stance of the Turkish authorities and banking authority to be more specific, during the post global crisis period, Turkish banking system remained well capitalized and healthy while growth performance of Turkish economy showed a slight glitch since 2007, and performing just under the potential growth rate. Looking at the overnight rate, the coefficient is again significant and negative in all specifications and indicate that with lower nominal rates (inflation, exchange rate as well for the given monetary policy and exchange rate regime) stability is augmented.

8. Conclusion

In this paper, the Z-score measurement as the indicator of individual bank stability has been utilized to identify stability differentiation between Islamic and conventional banks in Turkey. The use of Z-Score for this purpose have been rather well received since bank based data became more available through bankscope, and national authority sources. Thus there are several cross country investigation

following the global financial crisis. This is mainly due to the mere observation of considerable decoupling of Islamic finance from conventional finance in terms of growth and soundness. This paper is based on the country-level data of the banking industry in Turkey, and for that matter it is the first study about this market, where Islamic banking is considered to have huge potential.

The main result of this paper shows that in general, Islamic banks in Turkey tend to have significantly higher level of stability compared to the conventional banks. From this perspective it is consistent with other studies in the literature. Moreover bank size in Islamic banking implies lower the risks smaller the bank type conclusions.

Another interesting result is the growth performance and soundness might counter act in certain times. That is a probable result if the analysis coincides with a period where economic cycle and the financial cycle differentiates. Over longer horizons, this result would not be supported. However, proactive policy changes in the financial markets is expected to improve financial soundness indicators, during the beginning of an economic downturn.

While Beck, Demirgüç-Kunt ve Merrouche (2013) claims that Islamic banking and conventional business models do not display significant differences in efficiency, asset quality and stability in general, Sakarya and Kaya (2013) points out a similar efficiency profile with a relatively more equity based model for Islamic banks in Turkey. These results are also confirmed here, from stability perspective. Thus the stability measure used here, the Z-Score, incorporates both profitability and the leverage.

Given the global interest in Islamic banking and increased importance of participation banking in Turkey, this type of analyses should be revisited from time to time. Both Global trends and domestic trends are pushing for new non deposit/non participation based funding opportunities for Islamic banks. Thus, this will eventually lead to a higher leveraged but also bigger Islamic finance institutions. Moreover the Islamic Law based finance might have deficiencies in risk management as stated by Hasan and Dridi (2010). Hence Islamic banks, becoming an image of soundness since global crisis and building upon this image, would need to constantly check their relative position with conventional banks.

Moreover this will require introduction of new regulations, standards and compliance with Islamic rules at global scale.

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